

NAVSEA
STANDARD ITEM

FY-04 (CH-2)

ITEM NO: 009-77
DATE: 20 MAY 2003
CATEGORY: II

1. SCOPE:

1.1 Title: Cofferdam Requirements; accomplish

2. REFERENCES:

2.1 Standard Items

2.2 S0600-AA-PRO-160/CH-16, Underwater Ship Husbandry Manual, Cofferdams

3. REQUIREMENTS:

3.1 Accomplish the requirements of 009-09 of 2.1 for the installation of each cofferdam (plug, patch, dry chamber, and stern tube seal) in accordance with 2.2 and Attachment A.

3.2 Submit a sketch with the procedure of 3.1 showing overall dimensions, stiffener spacing, sizes and thickness of structures, and any other information required to describe the design. Sketch and procedure shall show the following:

3.2.1 Ballasting and deballasting arrangements.

3.2.2 Provisions for pumping and venting cofferdam.

3.2.3 Type and locations of warning signs to be installed for each cofferdam, patch, and shaft wrap.

3.2.4 Construction details, reinforcing details, and bolting details of each cofferdam.

3.2.4.1 Damage control plugs are not acceptable as a cofferdam.

3.2.5 Type and location of an audible, electrically-operated alarm system to indicate failure of cofferdam and flooding of space. Alarm shall be located within the vicinity of the Quarterdeck or OOD Station, or at a mutually agreed upon location as designated by the SUPERVISOR, for Ship's Force monitoring.

3.2.5.1 Alarm unit shall be capable of indicating, via a light, whether power to the unit is on or off.

3.2.5.2 Alarm unit must be capable of determining, via a test button, whether the flooding alarm is fully operational.

3.2.5.3 Alarm unit shall have backup battery capable of providing electrical backup power when ship's power is down.

3.2.5.4 Alarm unit shall have at least a 90-decibel audible alarm.

3.2.5.5 Alarm unit shall be capable of detecting, via light or audible alarm, electrical cable integrity. If the electrical cable from the alarm to the Quarterdeck becomes disconnected or cut, the light or audible alarm will alert personnel.

(V)(G) "VERIFY TESTS"

3.2.6 Test the alarm system to determine if unit is functioning.

3.2.6.1 Test the alarm system's backup power.

3.2.6.2 Test electrical cable integrity failure.

3.2.7 Twenty-four hour continuous on-site surveillance by contractor personnel in the immediate space or compartment being protected by installed cofferdam, patch, or shaft wrap will be acceptable in lieu of electrically-operated alarm system.

3.2.7.1 Provide two-way communication between Quarterdeck, OOD Station or designated location, and surveillance personnel on a 24-hour basis.

3.2.8 Upon installation of hard blanks in violated system, the requirement for 24-hour surveillance may be waived.

3.3 Submit original and revised design and maintenance records required by **Paragraph 16-5.2.7** of 2.2 to the SUPERVISOR upon request.

3.4 Prior to installation of a cofferdam, Ship's Force shall be notified in writing of the location of the cofferdam and level of protection provided.

3.4.1 Submit one legible copy, in hard copy or electronic media, of Ship's Force notification to the SUPERVISOR.

(V) "INSPECT SEAL"

3.5 Inspect to ensure that each cofferdam is sealed prior to removal of equipment which will affect watertight integrity in accordance with **Paragraph 16-5.5.1** of 2.2.

3.6 Remove each cofferdam, patch, shaft wrap, and associated components upon completion of repairs.

4. NOTES:

4.1 None.

ATTACHMENT A
SUPPLEMENTAL REQUIREMENTS FOR COFFERDAM PATCHES

Note: This attachment takes precedence in case of conflict with the requirements of S0600-AA-PRO-160/CH-16.

1. Procedures for blanking hull openings shall include steps for ensuring that the valve being removed or the system being opened corresponds to the hull opening being blanked by divers. Ship's docking drawings and piping plans shall be used to identify correct hull opening. Openings shall be located either by hammering on the valve or adjacent structure inside the ship and the diver sensing the noise and vibration or by the use of locator lines suspended from known frames on deck or measure from weld seams, other hull openings/appendages to locate correct opening. Divers shall verify that the opening corresponds to the type and size shown on the docking drawing.
2. Cofferdam patches used to seal sea suction, discharges, ballast tank flooding valves, and other hull openings shall be designed to provide a minimum factor of safety, using the basic allowable tensile stresses and factors of safety specified for Building and Similar Type Structures, when subject to external water pressure forces. Provide calculations with Process Control Procedure.
3. Cofferdams that seal to the ship's hull shall be templated from the hull to ensure proper fit and minimize gasket material thickness. Typical tools and techniques for templating are shown on drawings 6698079 and 6697929. Gaskets shall be rubber or closed-cell neoprene per ASTM D1056-91, Grade 2CQ. Thickness shall be the minimum required to achieve a seal, but in no case greater than two inches.
4. Cofferdam patches and associated attachment hardware shall be visually inspected for cracks, corrosion, and deformation prior to installation and deficiencies corrected. Gaskets shall be inspected for damage, cleanliness, adhesive bond, and pliability and repaired or replaced as required prior to each use.
5. Cofferdam patches shall be secured to permanent structure such as sea chest grates or splitter bars. Where permanent structure is not available in the system being worked (e.g., discharges), hogging lines to nearby structure or to weather decks shall serve as the primary device for securing the patch to the hull. A secondary attachment to temporary structure (e.g., spider devices) may be installed in the system to help seal the patch when the primary device (i.e. hogging line) will not provide sufficient sealing force because of hull configuration.
6. Eductors shall only be used to dewater systems. Cofferdams with eductors shall be vented to the surface and positive seal valve shall be installed to prevent backflow when the eductor is secured. A cofferdam seal must still be confirmed internally as internal connections are disturbed. Surface venting provides an easy method for confirmation of cofferdam seal prior to

disturbance of internal connections. Once a system is dewatered, eductors shall be secured to assess performance of the blank. Eductors shall not be active when internal ship's piping is being opened. Eductor water supplies shall be suspended via strain reliefs to nearby structure or attachment points so that the weight of the hose is not being carried by the blank. Eductor water supply valve shall be clearly marked.

7. When the installed cofferdam patch will serve as the only barrier to the sea (one-valve protection) for any period of time, the Process Control Procedure shall provide for Ship's Force sign-off via the SUPERVISOR prior to use.